

INDIANA'S WATER USE — 1987

As the demand for water increases, the need for well planned and managed water supplies becomes a necessity. Although Indiana is considered a "water rich" state, there are areas of concern. Availability of water in a particular area is a function of such factors as precipitation, geology, topography, and vegetative cover. Water availability is also influenced by changing population and development patterns that directly affect water use. In order to make effective water management decisions, current water withdrawal data is needed. "Indiana's Water Use 1987" is an overview of current significant water uses and is intended to aid in the planning and proper management of Indiana's water resource.

WATER MANAGEMENT PROGRAM

In 1983, the Indiana General Assembly enacted Indiana Code 13-2-6.1 (Water Management Act) which mandated the Indiana Department of Natural Resources to conduct an inventory of significant users of water. The statute provides that the owners of all wells or surface intakes which have the capability of withdrawing one hundred thousand gallons of ground or surface water per day must register with the Department of Natural Resources.

Registered significant withdrawal facilities have been divided into six general water use categories: irrigation (agricultural, golf course, landscaping); public supply (water works, mobile home parks, schools); industrial (process and cooling water, waste assimilation, sand and gravel operations); energy production (power generation, coal preparation, heating and cooling); rural use (livestock watering and fish hatcheries); and miscellaneous (ski resorts, fish and wildlife areas, etc).

Since the passage of the Water Management Act in 1983 more than 2,900 significant water withdrawal facilities have been registered. Currently there are 2,614 active registrations on file. This figure represents more than 4,000 wells and 1,000 surface intakes. The breakdown of all registered facilities is as follows: irrigation, 1,339; public supply, 682; industrial, 468; energy production, 72; miscellaneous, 45; and rural use, 11 (see Figure 1).

ANNUAL WATER USE REPORTS

Owners of registered facilities are required to report water withdrawals on an annual basis. Metering of water withdrawals is not presently required, and a number of estimating techniques are considered acceptable for reporting purposes. The two most frequently used estimation methods are time of pump operation and direct measurement of amount applied. During upcoming years, additional emphasis will be placed on assessing the accuracy of the data submitted for individual facilities. In those cases where inaccurate water use data is being submitted, metering will be required.

At the time of writing, 99% of the registered facilities had submitted their annual water use reports. Reported withdrawals increased 2.6% from 1986 to 1987. A large part of this increase can be attributed to greater compliance with the Water Management Act's registration requirements.

During 1987, owners of registered facilities reported withdrawals totaling 3.16 trillion gallons of water. To illustrate the magnitude of this number, 3.16 trillion gallons of water would cover an area the size of the state of Indiana to a depth of approximately 4 feet. Of this total (3.16 trillion gallons), surface water withdrawals accounted for 2.99 trillion gallons (94.5%) and ground water use totaled 172.9 billion gallons (5.5%). Note that the terms "water use" or "use" in this report refer to withdrawal of water from available sources for beneficial purposes. In many instances, only a small portion of the water withdrawn is consumptively used.

Registered significant withdrawal facilities have a combined withdrawal capability of approximately 20.5 billion gallons per day (BGD). Of this capability, 17.6 BGD is from surface water sources and 2.9 BGD is from ground water supplies. Figure 1 shows the withdrawal capability and actual use for each of the water use categories by source.

In general, counties with high water usage are those with large metropolitan areas (see Figure 2). A few counties with smaller populations (Pike, Sullivan and Vermillion) reported large withdrawals primarily due to power generating stations with high surface water intake capabilities.

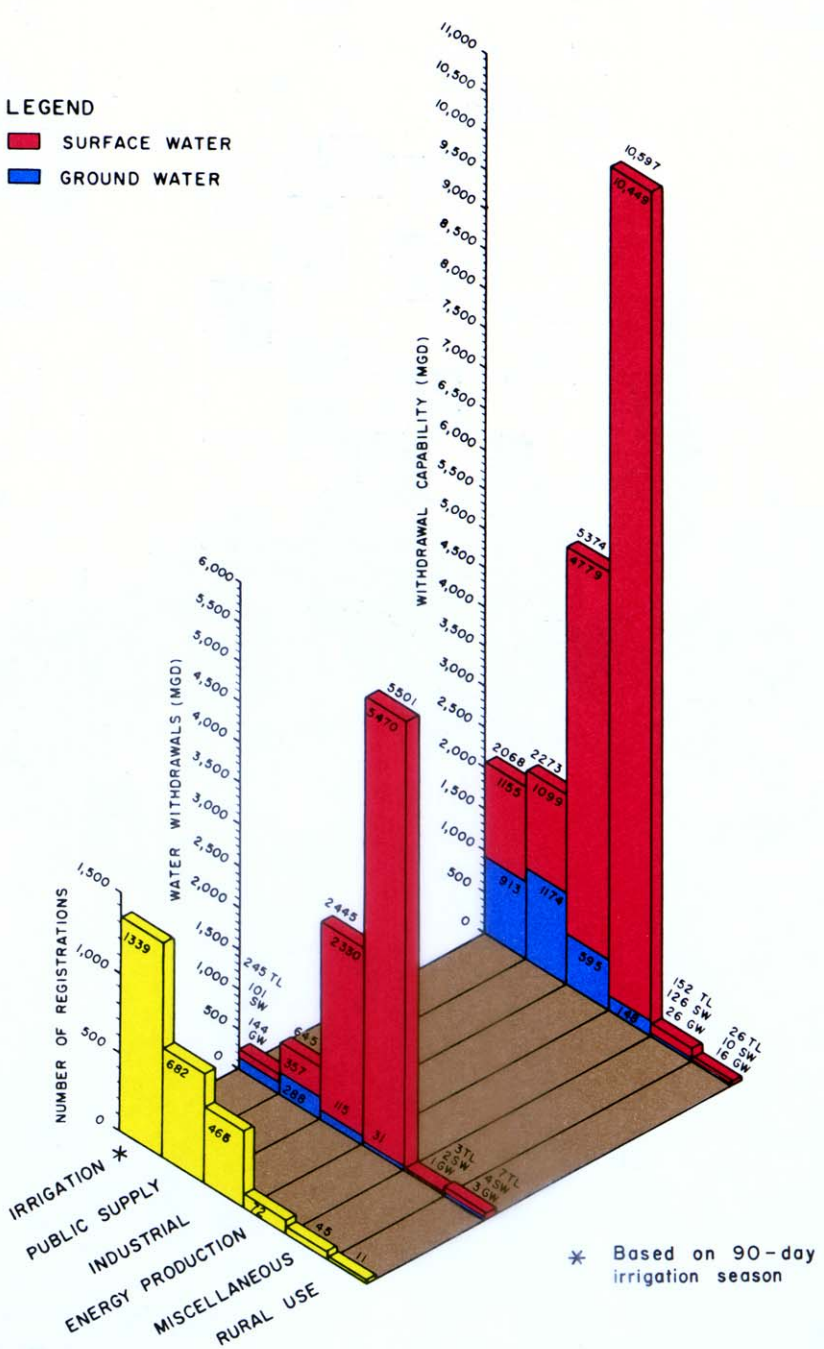


Figure 1. 1987 Water Use Statistics

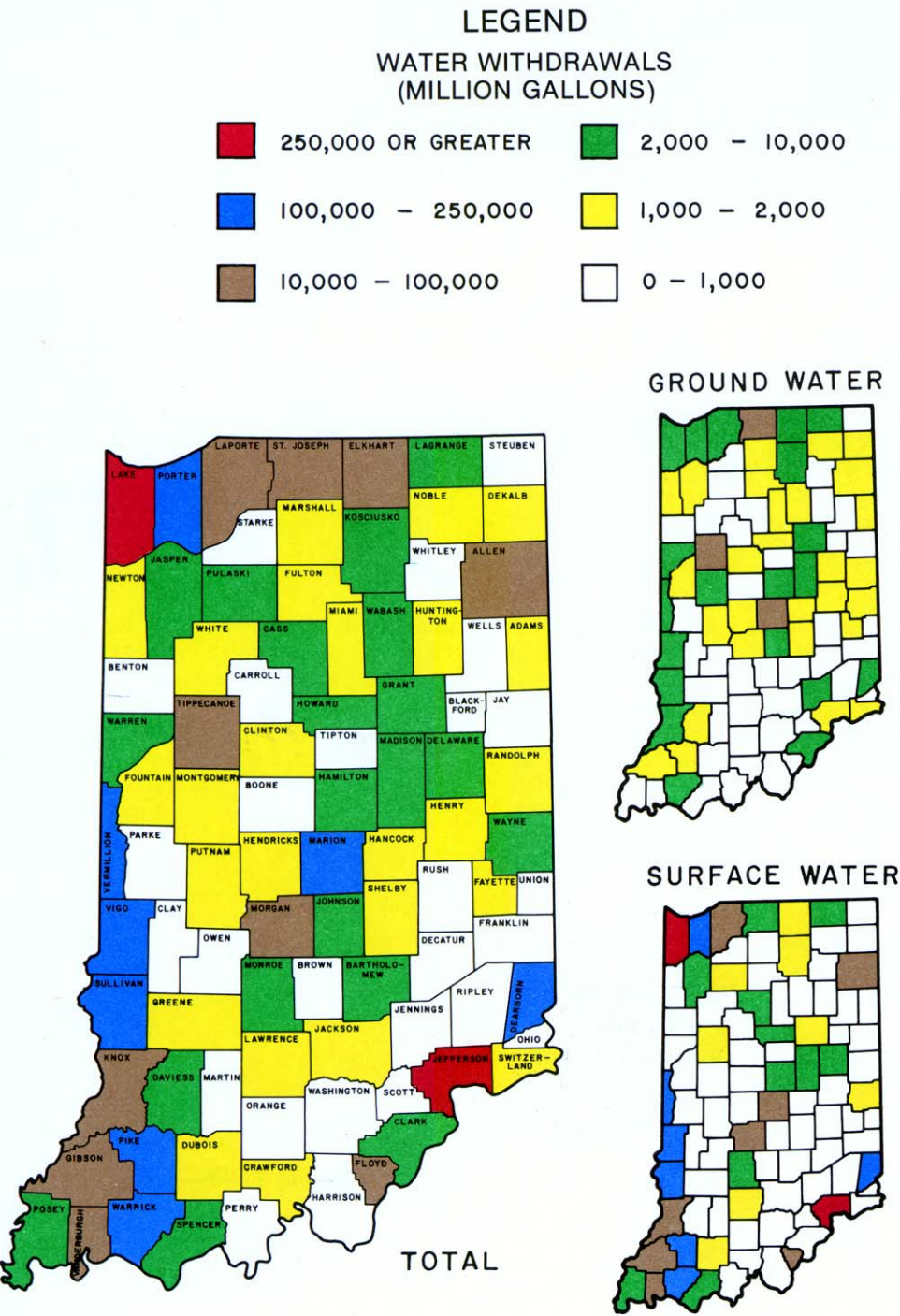


Figure 2. Statewide Water Use

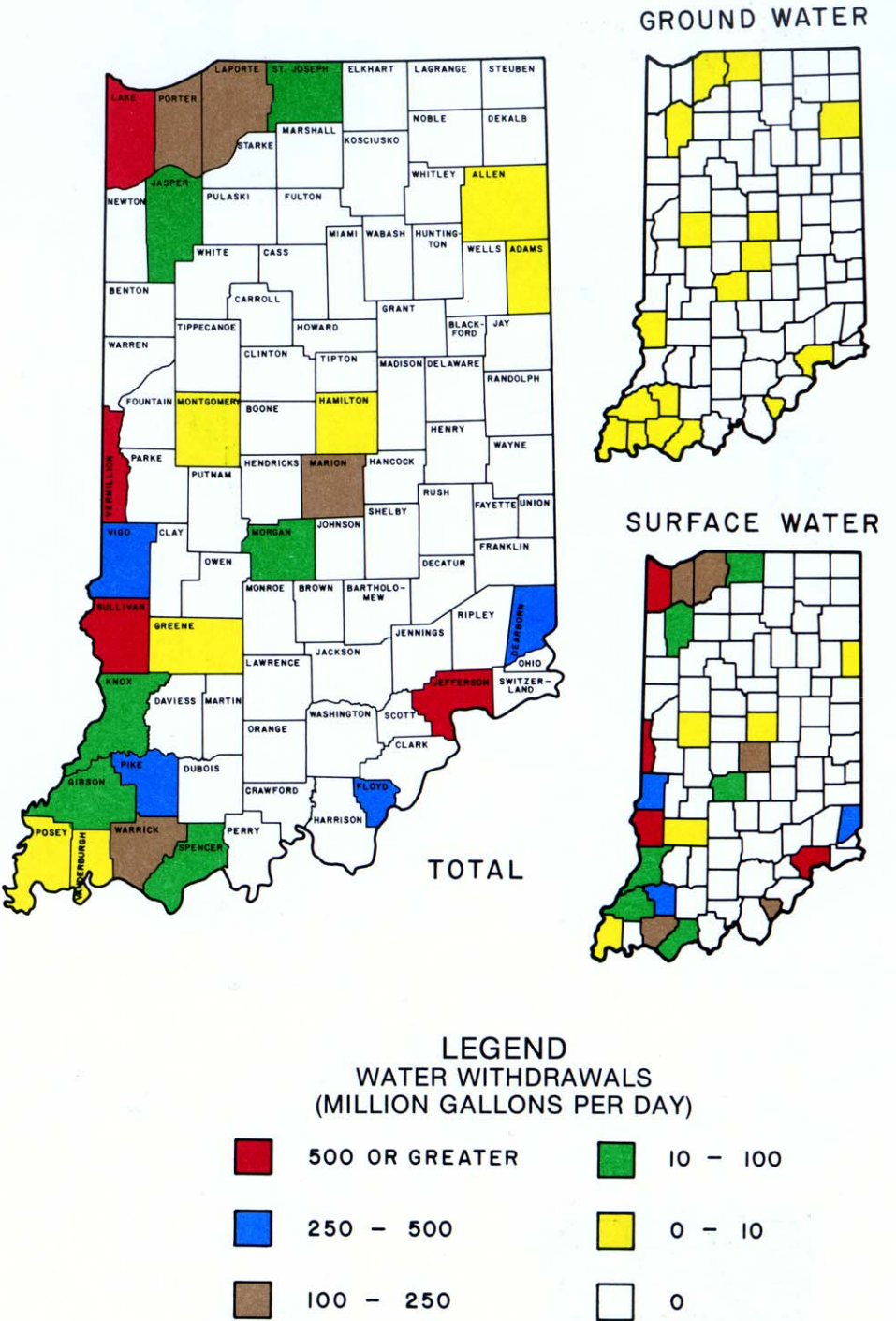


Figure 3. Energy Production Use

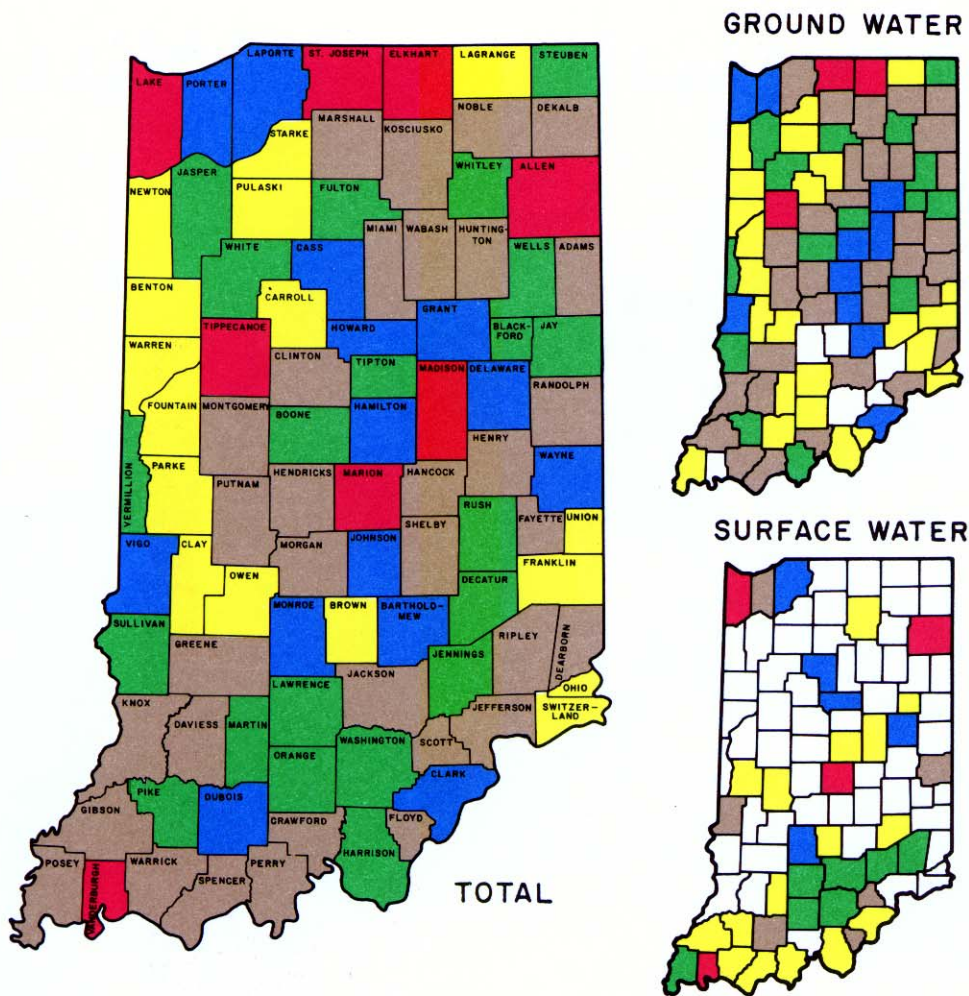


Figure 4. Public Supply Use

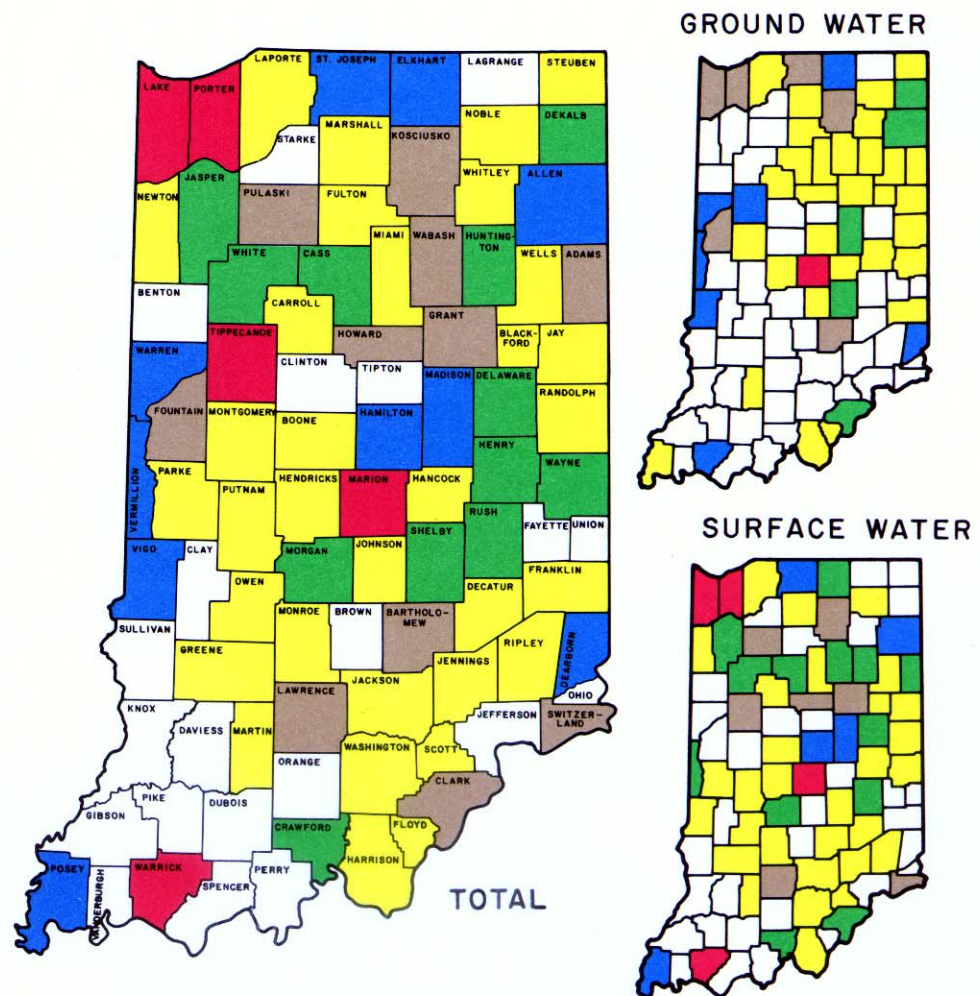
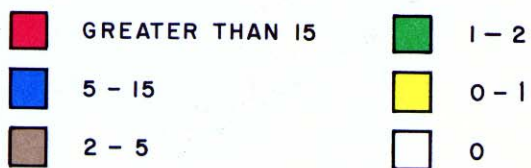


Figure 5. Industrial Use

LEGEND WATER WITHDRAWALS (MILLION GALLONS PER DAY)



ENERGY PRODUCTION USE

Energy production facilities represent less than 3% of the number of registered facilities but possess over 50% of the state's entire registered water withdrawal capability. Water withdrawals for energy production purposes averaged 5,501 million gallons per day (MGD) during 1987 (Figure 1). Surface water withdrawals constitute 99.4% of this figure. Over 99% of the surface water withdrawn for energy production is by coal fired power plants which use water for cooling purposes. Almost all of this water is returned to its source and is available for re-use within a few days. Energy production withdrawals account for about 63% of all water withdrawals in Indiana. The major sources of cooling water for energy production are the Ohio, Kankakee, Wabash, East Fork and West Fork of White Rivers and Lake Michigan. This point is illustrated in Figure 3.

PUBLIC SUPPLY USE

In Indiana, approximately 70% of the state's population purchases its water from public supply systems. During 1987, public water supply withdrawals averaged 645 MGD. Of this total, 357 MGD was taken from surface water sources and 288 MGD was pumped from ground water supplies (Figure 1). The county with the highest reported use in the public supply category was Marion County which used an average of 138 MGD. As shown in Figure 4, ground water was the primary source of public water supply for the majority of the counties in the state.

INDUSTRIAL USE

Many industrial water users purchase water from public utilities, however a majority of the large water users develop their own water supplies. Industrial self-supplied use for 1987 averaged 2,445 MGD. Surface water use averaged 2,330 MGD and ground water use averaged 115 MGD. (see Figure 1). Surface water withdrawals from Lake Michigan in Lake and Porter Counties account for over 80% of all industrial self-supplied withdrawals in Indiana. Information concerning industrial water use is highlighted in Figure 5.

IRRIGATION USE

Withdrawals for irrigation during 1987 averaged 245.0 MGD. Of this amount, 101 MGD was withdrawn from surface water and 144 MGD was withdrawn from ground water. These figures are based on a 90-day irrigation season (see Figure 1). The majority of irrigation withdrawals took place in the northern third of the state (see Figure 6). Counties that reported the largest withdrawals for irrigation purposes were Jasper (28 MGD) and Elkhart (24 MGD) Counties. Although withdrawals for irrigation are relatively small in terms of the total amount of water withdrawn, they are the major water use within some areas.

DOMESTIC SELF-SUPPLIED USE

One water use category unaccounted for in Indiana's registration system is domestic self-supplied use. It is estimated that approximately 30% of the state's population satisfy their water needs in this manner. Daily per capita water use estimates for this category range from 50-75 gallons for people in rural areas and up to 100 gallons for those in urbanized areas. In 1987, water withdrawals by this category are estimated to be about 130 MGD which constitutes approximately 1.5% of the total 1987 water use in the state (registered and non-registered) as shown in Figure 7.

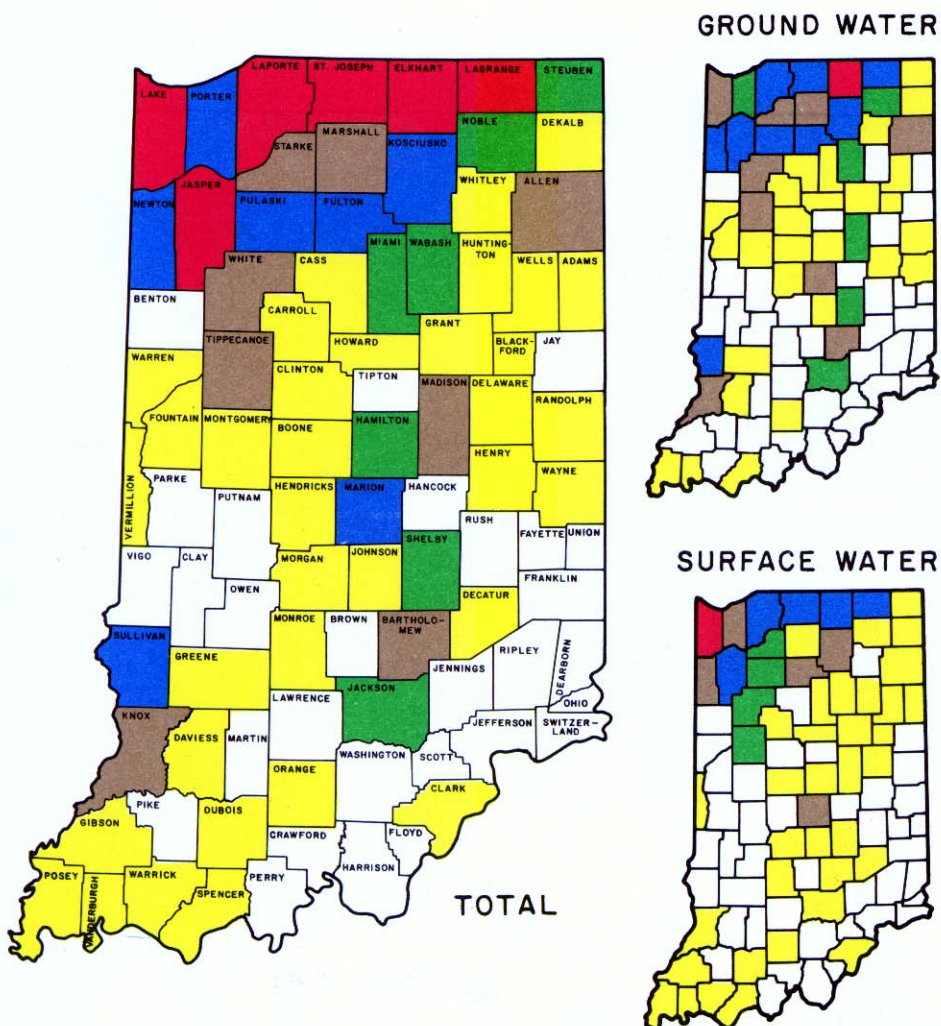


Figure 6. Irrigation Use

FOR MORE INFORMATION CONTACT

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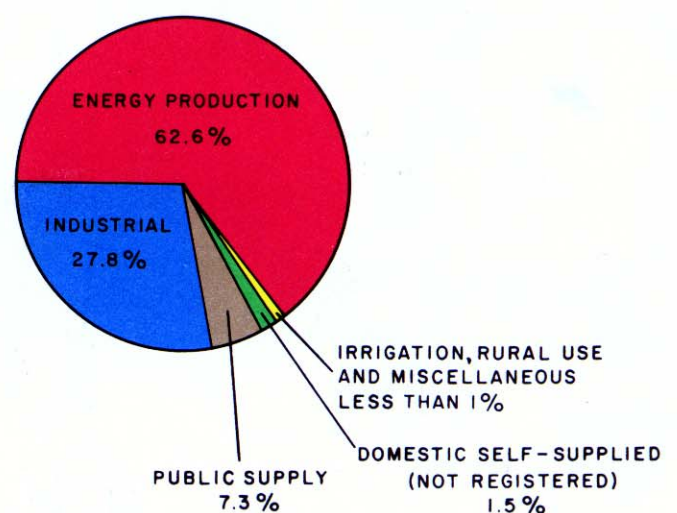


Figure 7. Percentage of Total Use by Category